Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

The Impact of Change in Interest Rates and Fluctuation in Oil Prices on the Performance of the U.S. Stock Market Indices

Anas Mohammed[1], Ismail Younes Yamin[2]

Abstract

This study aims to determine the impact of changes in interest rates and oil price fluctuations on the performance of the main U.S. stock market indices (Dow Jones, Standard & Poor's 500, and Nasdaq). The study period included monthly data for the variables from (2010 to 2022). The study used (Autoregressive Distributed Lag -ARDL) To test short- and long-term relationships between study variables. The study reached several results, most notably the presence of a negative impact of changes in interest rates on the performance of US stock market indices in the short term, and a negative impact on the Nasdaq index in the long term, as well as the presence of a positive impact of oil price fluctuations on stock indices in the short and long term, and this is due to that United States economy is closely linked to the energy and oil sectors. Considering the study's findings, it recommended the importance of investors benefiting from periods of rising interest rates by increasing investment in stocks in anticipation of a positive response to the market and an increase in its indicators in the medium and long term. It also recommended that investors take oil price fluctuations into consideration when making investment decisions in stocks, as rising oil prices tend to have a positive impact on indices, especially in the long term.

Keywords: *Changes In Interest Rates, Oil Price Fluctuations, US Stock Market Indices.*

Introduction

Throughout history, successive civilizations have dominated the world, from the Middle Ages to the present day, such as the Sumerian, Egyptian, Greek, and many others. If you review the history of those civilizations that have been on the throne of the world for a long time, you will find their interest in industry and trade, creating markets, and conducting buying and selling operations for products and services, and these operations developed. Today, it is called the global economy, which is controlled by the great powers, led by the United States of America.

Oil plays an important role in the wheel of the economy, especially its role in industrial companies, where it plays a fundamental role in the movement of the market and the goods in it and represents a large part of financial transactions in the global economy. At the same time, interest rates influence the wheel of the economy. It is the main determinant of making decisions that distribute capital. Whoever wants to deposit his money in the bank for the purpose of obtaining a return will search for the highest interest rate, and whoever wants to borrow will search for the lowest rate, so it is necessary to study their impact on him (Al-Adwani,2021).

The increasing demand for oil has linked it not only to the measure of the continuity of industrial companies, but also to the level of economic growth of countries, and its role in providing a financial surplus that contributes to financing and development for companies and governments alike. Oil has also played a major role since its discovery until the present time in moving the wheel of oil. The economy, which directly affects the costs of life and production, and thus the profitability of companies and their performance in financial markets and has an effective social and environmental impact on various economic and environmental sectors. This, in turn, makes measuring its impact one of the most complex features we must understand and evaluate (Al-Adwani,2021).

[1] Collage of Business, Amman Arab University, Amman, Jordan., Email: Azeidieh1982@gmail.com, (Corresponding Author), (https://orcid.org/0009-0004-3278-6455)

[2] College of business, Amman Arab University, Email: I.yamin@aau.edu.jo, (https://orcid.org/0000-0003-2008-1517)

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

The interest rate also affects the control of the money supply in circulation by changing this price up and down in the medium term, and raising interest means curbing borrowing operations and thus reducing the percentage of liquidity in the market, which leads to higher prices (Mhawish et al., 2021).

The relationship between oil prices and interest is a very important topic as it affects companies' stock prices, their continuity, their competitiveness, and their impact on economic growth. It is worth noting that whenever the demand for oil changes or the interest rate changes, the financial market is affected in some way, and thus the stock market is affected (as a result). We try to find this effect through the U.S. stock market indices: Dow Jones, Standard and Poor's 500 (S&P500), Nasdaq.

Literature Review

The relationship between the change in interest rates and the fluctuation of oil prices together is a very important study area for researchers because of their great influence on the economy and the global and American market in particular, as oil and the fluctuation of its prices affect the cost of economic activity by increasing or decreasing. On the other hand, the Federal Reserve reduces Interest rate to stimulate financial activity in a recession; The opposite is true when inflation occurs. Investors and economists alike view low interest rates as growth stimulants. Because it reduces the cost of personal borrowing, which in turn leads to greater profits, a strong economy accompanied by faster and greater movement of the economic wheel. (Cakmak&Acar,2022)

The problem of the study comes to determine the impact of the change in interest rates and the fluctuation of oil prices on the performance of the American stock market indices, as the United States has the strongest economy in the world. It relies on a market economy built on free investment and commercial competition, and its market is considered the main criterion for the economic situation of the entire world and a fundamental influence. Therefore, the change in both oil prices and interest rates may affect economic growth and the movement of trading, buying, and selling of stocks. (Gu. el al,2022))

Hamdan's study (2022) aimed to examine the effect of speculation and liquidity on the trading volume in the American stock market. The study followed the quantitative analytical approach, and the study population consisted of the American financial markets, and the study sample consisted of financial indicators in the American stock markets, from which Dow Jones was chosen., S&P500, Nasdaq) in weekly totals for the year 2020. The researcher used the "Views E-10" software to analyze the financial data, as the study reached many results, the most important of which is: the presence of a statistically significant effect at the significance level ($\alpha \leq 0.05$) for the ratio Speculation and liquidity on trading volume in the US stock market, and the presence of a positive and statistically significant effect of the rate of speculation on trading volume, Increasing the speculation ratio by one unit leads to an increase in the trading volume by ((0.019%) with other factors constant, that is, there is a statistically significant effect at the significance level $\alpha \leq 0.05$) of the speculation ratio on the trading volume in the American stock market. A direct and statistically significant effect of the liquidity ratio on trading volume, as increasing the liquidity ratio by 1% leads to an increase in trading volume by (0.017%) with other factors constant. The study recommended developing a system to set price ceilings to avoid price increases and fictitious trading volume resulting from harmful speculative practices.

The study by Alamgir & Amin (2021) aimed to show the relationship between the oil price and the stock market by bringing evidence from South Asia, by showing the interactive link between oil prices and the stock market in 4 selected countries from South Asia using the autoregressive distributed distribution (NARDL) model for the period 1997-2018. The study found a positive relationship between global oil prices and the stock market index, and the response of the stock market index to positive and negative oil price shocks is asymmetrical. One of the most important results of the study was that the rise in oil prices in the global market stimulates stock prices. Which indicates that South Asian countries do not follow the efficient market hypothesis (EMH). The study recommends that policymakers take initiatives to make the South Asian stock market more efficient by removing barriers to stock market development, developing

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

the country's infrastructure, enhancing stock market capacity, and restoring the confidence of market participants within the region.

The study by Wu (2023) demonstrated the role of long-term oil price changes in the stock market. It also aimed to demonstrate the ability of long-term changes (the past fifty years) in oil prices to predict stock returns in the United States market. The study also found that this model -which takes a long time to perform- much better than the single-interval model, long-run changes in the price of oil contain useful information about future real stock returns and excess returns over the Treasury bill rate. This variable alone can capture more than 1% of the variations in the next horizon (month) excess returns, and the predictive power is increasingly strong for the stock return. Over the long horizon, these results are robust when considering other common predictors in the model, and these results hold when considering different subsamples, as the variable contains useful information for future stock returns. The study recommended the need to study previous changes in oil prices in the long term.

The study (Al-Shalabi and Al-Samir, 2022) clarified the subsequent changes in the credit interest rate on companies' prices through a study on the Damascus Stock Exchange, to show the contributor to the credit interest rate on deposits and contributed both to the long-term success of the profits of companies listed on the market. Damascus Securities Exchange. This study was studied on companies listed on the Damascus Stock Exchange, through diversification from (2010-2017). The researcher used the descriptive analytical model in the general breakdown of company shares that relies on autoregression.

The most important results of the study are that, through the inductive test, it was revealed that the time series of the study variables are all based on the unit root, and that they are unstable at the general level, while these variables become stable at the first difference, according to the (KPSS) test, which means that these variables are integrated of the first degree. Only the short-term interest rate data is subject to a normal distribution, while the data for both the long-term interest rate and stock prices are not subject to a normal distribution, using the Jarque-Bear statistic. One of the most important recommendations of the study is to prepare more studies related to the long-term and short-term interest rates and their impact on stock prices.

Based on what was mentioned in the previous studies, the study hypotheses can be formulated as follows:

The main hypothesis: (H0): There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the U.S. stock market indices in all its dimensions (Dow Jones, Standard and Poor's 500). - S&P500), and Nasdaq in the short and long term.

The following sub-hypotheses branch out from this hypothesis:

The first sub-hypothesis (H0-1): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Dow Jones index in the U.S. stock market in the short and long term.

The second sub-hypothesis (H0-2): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Standard & Poor's 500 Index (500) in the U.S. stock market in the two terms, short and long term.

The third sub-hypothesis (H0-3): There is no statistically significant effect at the significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Nasdaq index in the U.S. stock market in the short and long term.

Method

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

The research in this part describes the method and procedures followed in its implementation, including a description of the study population, the research methodology followed, the data collection method, and the statistical processing that was used to analyze the data and draw conclusions.

This study was based on the use of the descriptive analytical method to review the most important literature related to the subject of the study. The descriptive method aims to study reality and is concerned with it as an accurate description and expressed qualitatively or electronically. The concept of the descriptive method is linked to the study of events, phenomena, positions, and opinions, analyzing them, and interpreting them, for the purpose of Reaching useful conclusions, either to correct, update, supplement, or develop this reality.

The field study was conducted to cover the applied aspect, through which I attempted to answer the study's questions and draw its conclusions by relying on financial data and information published on websites. The study used the Autoregressive Distributed Lag (ARDL) model to achieve this. It is an economic model used to analyze the relationship between economic variables in the long and short run. This model is characterized by including Autoregressive variables and Distributed Lag variables. The ARDL model can be used to analyze the temporal relationships between a dependent variable and independent variables.

Time variables express the effect of the previous values of the dependent variable on the current values, while distributed lag variables express the effect of changes in the explanatory variables on the dependent variable over multiple time stages to test and estimate the short- and long-term relationships between the study variables, to come up with a set of results and recommendations about the impact of change in Interest rates and oil price fluctuations affect the performance of US stock market indices (Pesaran, 2021).

To verify the existence of a long-run relationship between two or more variables in a time series. In the context of economics and finance, the cointegration test is used to check whether variables move together in the long run, which indicates that there is a complementarity between them. The integration test depends on a basic hypothesis, which is that variables move together in the long run even though they may Move independently in short. This means that variables can change temporarily from each other, but eventually transcend these temporary changes to remain connected in the long run.

There are three main steps to implement the ARDL model:

- Unit Root Test: In this step, the unit was analyzed for each variable to verify the presence of integration in the time series, that is, it is not random and has a specific pattern. If a variable has a unit root, it is assumed to have an integral.

- Cointegration Test: In this step, the cointegration test is used to verify the existence of a long-term relationship between variables. The test aims to verify whether the differences between the variables move randomly or if they move sustainably in the long term.

- Determining the relationship: If there is stability in the data and cointegration, the ARDL model can be used to determine the relationship between the study variables in the short and long term. (Pesaran, 2021).

A study by Khan.et al, (2021) showed the impact of oil prices on the development of the stock market in Pakistan using a new dynamic simulation approach (ARDL), highlighting the importance of its impact on the world's developed and developing economies, which are greatly affected by global oil prices, and more importantly after repeated bouts of economic crises. In different parts of the world at different times, such as the 2008 global crisis, the 2011 European debt crisis and the COVID-19 pandemic, investors are keen to know the potential impact of oil price volatility in general on global financial markets with a particular focus on stock market returns. The study also aims to the impact of oil prices and macroeconomic factors on the

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

development of the stock market in Pakistan through using a new dynamic distributed autoregressive simulation model for annual time series data starting from 1985 to 2017. The results revealed that the ARDL dynamic simulation model has a positive effect on oil prices, remittance flow, and foreign direct investment, while the exchange rate has a negative effect on market development. Securities in Pakistan, the study recommended that the government, policy makers and investors should estimate possible changes in oil prices, exchange rate and expected inflow of personal remittances and foreign direct investment to easily predict the performance of the stock market in Pakistan.

Results

This chapter includes a presentation of the results of the descriptive statistical analysis of the data, answering the study's questions, and testing its hypotheses of studying the impact of interest rate changes and oil price fluctuations on the performance of the three American stock market indices, the Dow Jones, the Standard & Poor's 500, and the Nasdaq.

The researcher described the study variables through the arithmetic mean and standard deviation, as in table (1):

Table (1) The Study Variable Descriptors

Variable	Mean	Median	Highest Value	Lowest Value	Std. Div.
DJI	20780.95	18137.56	36338.30	9774.02	7521.26
Nat. Log. Of DJI	9.876	9.806	10.501	9.187	0.368
SPX	2405.18	2116.77	4766.18	1030.71	989.30
Nat. Log. Of SPX	7.702	7.658	8.469	6.938	0.413
Nasdaq Index	6498.26	5145.21	15644.97	2109.24	3720.61
Nat. Log. Of Nasdaq Index	8.622	8.546	9.658	7.654	0.564
Change in Interest Rate	0.024	0.000	0.880	-0.755	0.133
Change in Oil Prices	0.007	0.015	0.598	-0.426	0.109

It appears from the table that the mean of the Dow Jones Index reached 20780.952, while the standard deviation was 7521.259. The lowest value reached 9774.020, while the highest value was 36338.300. The variable was processed by taking its natural logarithm to reduce problems of deviation and variance since the readings are large numbers. To make the numbers more understandable, the arithmetic mean after the natural logarithm became 9.876, and the standard deviation became 0.368, which indicates stability in the data and its clustering around a normal distribution, which may indicate that the policies followed by the state in its various institutions are somewhat successful in growth and progress, especially in terms of Related to the performance of the US stock market. The median became 9.806, while the highest value became 10.501 and the lowest value became 9.187, This indicates an increase in the value of the index in general, which reflects a positive performance of the stock market. Taking the natural logarithm reduced the variance in values and reproduced them within a narrower range, making them easier to handle statistically. In general, the numbers indicate the good performance of stock market indices, with relatively limited fluctuation in interest rates and oil prices.

The extended Dickey-Fuller test was used in this study, which is based on a basic hypothesis that assumes there is no stability in the time series. This basic hypothesis is called the null hypothesis. As for the alternative, which indicates the stationarity of the time series, where if the significance value is less than 5%, the hypothesis is accepted. alternative, which indicates the stability of the time series. Look at table (2):

Table (2) Unit Root Test

Augmented Dickey-Fuller test statistic			
Variable	**T Value, I(0)**	**Indication**	**Result – stationarity level**

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

DJI at Level	-1.1068	0.7125	I(0) – not stationary
DJI -at 1st difference	-13.9317	0.0000	I(1) - stationary
S&P500 at Level	-1.1494	0.6952	I(0) - not stationary
S&P500 at 1st difference	-14.1033	0.0000	I(1) - stationary
Nasdaq at Level	-1.2723	0.6417	I(0) - not stationary
Nasdaq at 1st difference	-13.4117	0.0000	I(1) - stationary
Interest Rate at Level	-5.8661	0.0000	I(1) - stationary
Oil Prices at Level	-9.6062	0.0000	I(1) - stationary

The results of the table above observed the alternative hypothesis, which shows sufficient time stability at the level of the two variables of oil change and change in incentive trends, while the initial financial indicators were set at the first difference, where the value of moral significance was less than 5%, which indicated temporal stability.

as indicated before, the cointegration test is used to verify the existence of a long-term relationship between variables, table (3) show the results from the cointegration test:

Table (3) Cointegration Rank Test

Unrestricted Cointegration Rank Test (Trace)				
Prob.**	Critical Value	Trace	**Hypothesized**	
		Statistic	Eigenvalue	**No. of CE(s)**
0.0000	69.81888752	109.1652917	0.281182026	**None ***
0.0029	47.85612716	59.31307684	0.219370896	**At most 1 ***
0.3031	29.79707334	21.91715057	0.083869477	**At most 2**
0.3948	15.49471288	8.690089271	0.048813781	**At most 3**
0.2871	3.841465498	1.133230624	0.007476748	**At most 4**
Trace test indicates 2 cointegrating equation(s) at the 0.05 level				
*** denotes rejection of the hypothesis at the 0.05 level**				
****MacKinnon-Haug-Michelis (1999) p-values**				
Unrestricted Cointegration Rank Test (Max-eigenvalue)				
Prob.**	Critical Value	Max-Eigen	**Hypothesized**	
		Statistic	Eigenvalue	**No. of CE(s)**
0.0003	33.87686662	49.85221491	0.281182026	**None ***
0.0020	27.58433779	37.39592627	0.219370896	**At most 1 ***
0.4316	21.1316163	13.2270613	0.083869477	**At most 2**
0.4255	14.26460015	7.556858648	0.048813781	**At most 3**
0.2871	3.841465498	1.133230624	0.007476748	**At most 4**
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 0.05 level				
*** denotes rejection of the hypothesis at the 0.05 level**				
****MacKinnon-Haug-Michelis (1999) p-values**				

The results of the Trace and Max-eigenvalue tests provide a better insight into the long-term dynamics between variables in the context of time series analysis. Both tests clearly show cointegration at the 0.05 level of significance, which indicates the presence of long-run relationships between the variables. These long-run relationships are an important focus that calls for adopting the autoregressive distributed lag (ARDL) model. This model can enhance the ability to better identify and interpret these relationships, enabling the long-term effects of these relationships to be estimated in a precise manner.

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

Based on what was indicated above, and after applying the (Lag Order Selection) that shows it is permissible to use two slowdown periods, Accordingly, the researcher decided to choose two slowdown periods in the ARDL study model, which is what most selection criteria agreed upon and test the hypothesis on the short and the long term, table (4) shows the results of testing the first hypothesis in the short term:

Table (4) Results of Testing The 1st Hypothesis in The Short Term.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DJI (-1)	0.683	0.083	8.283	0.0000
DJI (-2)	0.143	0.082	1.744	0.0834
Chg. in Interest Rate	0.011	0.035	0.310	0.7567
Chg. in Interest Rate (-1)	-0.117	0.040	-2.945	0.0038
Chg. in Interest Rate (-2)	0.075	0.034	2.216	0.0282
Chg. in Oil Prices (-1)	0.121	0.036	3.389	0.0009
R-Squared	0.9900	S.D. dependent var		0.3627
Adjusted R-squared	0.9894	Akaike info criterion		-3.6842
F-statistic	1792.3830	Prob(F-statistic)		0.0000

The estimation results shown in table (4) show the value of the Adjusted R-Squared coefficient of determination = 0.9894, which is an acceptable value indicating that the model explains 98.94% of the changes in the dependent variable, the Dow Jones Index. The value of the F-Statistic coefficient was = 1792.3830. The statistical significance is 0.0000, which indicates that the model is statistically accepted. It also appears from the table regarding the variable of change in the interest rate that there is a negative impact of the change in the interest rate on the Dow Jones Index in the period t-1 (month), where the value of the regression coefficient reached -0.117 (negative) with a statistical significance of 0.0038. As for the fluctuation in oil prices, it was shown that there is A positive impact on the Dow Jones Index in period t (current), where the value of the regression coefficient reached 0.121 (positive), with a statistical significance of 0.0009, and a positive impact on the Dow Jones Index at the 10% level in period t-1, where the value of the regression coefficient reached 0.058, with a statistical significance of 0.0848.

Results of testing the first hypothesis in the long term:

Table (5) Results of Testing The 1st Hypothesis in The Long Term

Levels Equation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Chg. in Interest Rate	-0.1783	0.1680	-1.0613	0.2903
Chg. in Oil Prices	1.0333	0.4021	2.5699	0.0112
CointEq (-1)*	-0.1732	0.0304	-5.6967	0.0000

The estimation results shown in Table No. (5) showed that the CointEq long-term error correction model was statistically significant with a factor of (0.1732), which indicates an error correction speed of 17.32% to address the errors of the previous period in the current period. It also appears from the table regarding the interest rate change variable that there is no impact on the Dow Jones Index in the long run, as the value of the regression coefficient reached -0.1783 (negative) with a statistical significance of 0.2903. As for the fluctuation in oil prices, it was found that there was a positive impact on the Dow Jones Index in the long term, as the value of the regression coefficient reached 1.0333, with a statistical significance of 0.0112. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted, which says, "There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Dow Jones index in the American stock market."

Results of testing the second hypothesis in the short term:

Table (6) Results of Testing The 2nd Hypothesis in The Short Term

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DJI (-1)	0.688	0.081	8.506	0.0000
DJI (-2)	0.185	0.081	2.295	0.0232
Chg. in Interest Rate	0.006	0.035	0.183	0.8551
Chg. in Interest Rate (-1)	-0.146	0.040	-3.653	0.0004
Chg. in Interest Rate (-2)	0.088	0.034	2.551	0.0118
Chg. in Oil Prices (-1)	0.117	0.036	3.231	0.0015
R-Squared	0.9919	S.D. dependent var		0.407271
Adjusted R-squared	0.9914	Akaike info criterion		-3.663349
F-statistic	2217.63	Prob(F-statistic)		0.0000

The estimation results shown in Table No. (6) show that the value of the Adjusted R-Squared coefficient of determination = 0.9914, which is an acceptable value indicating that the model explains 99.14% of the changes in the dependent variable, the Standard & Poor's Index. The value of the F-Statistic coefficient was = 2217.63 with a statistical significance of 0.0000, which indicates that the model is statistically acceptable. It also appears from the table regarding the interest rate change variable that there is a negative impact of the change in the interest rate on the Standard & Poor's index in the period t-1 (month), where the value of the regression coefficient reached -0.146 (negative) with a statistical significance of 0.0004 and a positive impact on the Standard & Poor's index in Period t-2 (two months), where the value of the regression coefficient reached 0.088, with a statistical significance of 0.0118, and there was no effect on the Standard & Poor's index in period t, where the value of the regression coefficient reached 0.006, with a statistical significance of 0.8551. As for the fluctuation of oil prices, it was found that there was a positive impact on the Standard & Poor's index in period t, where the value of the regression coefficient reached 0.117, with a statistical significance of 0.0015, and a positive impact on the Standard & Poor's index in period t-1, where the value of the regression coefficient reached 0.082, with a statistical significance of 0.0155.

Results of testing the second hypothesis in the long term:

Table (7) Results of Testing The 2nd Hypothesis in The Long Term

Levels Equation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Chg. in Interest Rate	-0.4125	0.2768	-1.4904	0.1383
Chg. in Oil Prices	1.5671	0.6786	2.3093	0.0223
CointEq (-1)*	-0.1268	0.0215	-5.8989	0.0000

The estimation results shown in Table No. (7) showed that the CointEq long-term error correction model was statistically significant with a factor of (0.1268), which indicates an error correction speed of 12.68% to address the errors of the previous period in the current period, It also appears from the table regarding the interest rate change variable that there is no impact on the Standard & Poor's index in the long term, as the value of the regression coefficient reached -0.4125, with a statistical significance of 0.1383. As for the fluctuation of oil prices, it was found that there was a positive impact on the Standard & Poor's index in the long term, as the value of the regression coefficient reached 1.5671, with a statistical significance of 0.0223. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted, which says, "There is a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Standard & Poor's 500 (S&P500) index in the US stock market".

Results of testing the third hypothesis in the short term:

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

Table (8) Results of Testing The 3rd Hypothesis in The Short Term.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Nasdaq (-1)	0.7179	0.0806	8.9036	0.0000
Nasdaq (-2)	0.1801	0.0793	2.2697	0.0247
Chg. in Interest Rate	-0.0447	0.0411	-1.0861	0.2792
Chg. in Interest Rate (-1)	-0.1612	0.0470	-3.4334	0.0008
Chg. in Interest Rate (-2)	0.0947	0.0400	2.3688	0.0192
Chg. in Oil Prices (-1)	0.1479	0.0417	3.5468	0.0005
R-Squared	0.9941	S.D. dependent var		0.5577
Adjusted R-squared	0.9938	Akaike info criterion		-3.3520
F-statistic	3052.7320	Prob(F-statistic)		0.0000

The estimation results shown in Table No. (8) show the value of the Adjusted R-Squared coefficient of determination = 0.9938, which is an acceptable value indicating that the model explains 99.38% of the changes in the dependent variable, the Nasdaq index. The value of the F-Statistic coefficient was = 3052.7320 in significance. The statistic is 0.0000, which indicates that the model is statistically accepted. It also appears from the table regarding the interest rate change variable that there was a negative impact of the change in the interest rate on the Nasdaq index in the period t-1, where the value of the regression coefficient reached -0.1612, with a statistical significance of 0.0008, and a positive impact on the Nasdaq index in the period t-2, where the value of the regression coefficient reached 0.0947. With a statistical significance of 0.0192 and no impact on the Nasdaq index in period t, as the value of the regression coefficient was -0.0447 with a statistical significance of 0.2792. As for the fluctuation of oil prices, it was found that there was a positive impact on the Nasdaq index in period t, where the value of the regression coefficient reached 0.1479 with a statistical significance of 0.0005, and a positive impact on the Nasdaq index in period t-1, where the value of the regression coefficient reached 0.1110 with a statistical significance of 0.0057.

Results of testing the third hypothesis in the long term:

Table (9) Results of Testing The 3rd Hypothesis in The Long Term

Levels Equation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Chg. in Interest Rate	-1.0891	0.4898	-2.2235	0.0277
Chg. in Oil Prices	2.5370	1.0314	2.4597	0.0151
CointEq (-1)*	-0.1020	0.0160	-6.3901	0.0000

The estimation results shown in Table No. (9) showed that the CointEq long-term error correction model was statistically significant with a factor of (0.1020), which indicates an error correction speed of 10.20% to address the errors of the previous period in the current period. It also appears from the table regarding the interest rate change variable that there is a negative impact on the Nasdaq index in the long run, as the value of the regression coefficient reached -1.0891, with a statistical significance of 0.0277. As for the fluctuation in oil prices, it was found that there was a positive impact on the Nasdaq index in the long term, as the value of the regression coefficient reached 2.5370, with a statistical significance of 0.0151. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted, which says, "There is a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the change in interest rates and the fluctuation in oil prices on the performance of the Nasdaq index in the American stock market."

Discussion

The results of the study indicate that there are significant effects of changes in interest rates and oil price fluctuations on the performance of US stock market indices in the short and long term.

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

The lack of a significant effect of changes in the short-term interest rate can be explained by the fact that the stock market needs a period to absorb and process new information related to monetary policy and interest rates before it is reflected in stock prices. While the results of the study showed a negative impact of changes in the interest rate on the indicators in period t-1 and a positive impact in period t-2. This is consistent with economic theory, where rising interest rates tend to attract investors from stocks towards bonds, which negatively affects indices, while the economy may respond positively to lower interest rates in the longer term through increased investment and economic growth.

The results also showed a positive impact of oil price fluctuations on the indicators, whether in the short or long term, and this is due to the US economy's close connection to the energy and oil sectors. The rise in oil prices reflects positively on the profitability of oil companies and energy companies, which raises market indicators. These results are consistent with most previous studies that indicate the existence of a relationship between macroeconomic variables, such as interest rates and oil prices, and the movement and performance of stock indices.

These results can be used to develop investment strategies in stocks by considering the impact of changes in monetary policy and interest rates, as well as oil price fluctuations, on companies' performance and its reflection on market indicators. Investors can also take advantage of periods of low interest rates to buy stocks with the expectation of a positive market response in the medium and long term.

- The study recommends investors to take advantage of periods of rising interest rates by increasing investment in stocks in anticipation of a positive response to the market and an increase in its indicators in the medium and long term.

- The study recommends studying other factors that affect stock prices and index values in the near term or long-term expectations, such as new regional blocs such as BRICS, or the impact of the Artificial Intelligence AI revolution on companies and thus indices in global and the US stock market.

- We advise investors in the U.S. stock market to consider the impact of changes in interest rates on the performance of market indices, as rising interest rates tend to negatively affect stock prices in the short term.

Author Contributions

Following authors contributed to this work:

Anas Mohammed: By choosing topic, coordinated data collection and analysis, drafting and revised the manuscript, conducted statistical analyses, and interpreted results, Ensured adherence to publication guidelines.

Prof. Ismail Yamin: Supervised the overall research project, secured funding for the study, Assisted with data collection and literature review.

All Authors agree to be accountable for all aspects of the work.

Disclosure Of Interest

There is NO interest to declare.

Declaration Of Funding

No funding was received.

Journal of Ecohumanism
2024
Volume: 3, No: 6, pp. 498 – 508
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i6.4021

All data that was used in this paper can be access at www.nyse.com , www.nasdaq.com , www.eia.gov , www.wsj.com, www.frbdiscountwindow.org .

References

Al-Adwani, Mubarak Nader, (2021). The volatility of oil prices contributed to economic growth in Kuwait. Scientific Journal of Business Research, 41(2), 327-375

Mahawish, Saleh, Al-Sagheer, Abdel Fattah, and Abu Talib, Abdel Wakil, (2021). The impact of the change in interest rates on economic growth in developing countries (a case study of Ethiopia), Journal of African Research and Studies and the Nile Basin Countries, 2(1), 1077-1116

Hamdan, Nidaa, (2022). The impact of speculation and liquidity on trading volume in the US stock market, Master's thesis, Amman Arab University, Jordan.

Alamgir, F., & Amin, S. B. (2021). The nexus between oil price and stock market: Evidence from South Asia. Energy Reports, 7, 693-703.

Wu, S. J. (2023). The role of the past long-run oil price changes in stock market. International Review of Economics & Finance, 84, 274-291.

Al-Shalabi, Mutee and Al-Samir, Hussein. (2022). Studying the impact of changes in the credit interest rate on companies' stock prices (an applied study on the Damascus Stock Exchange). Economic Sciences Series, 44(22).

Pesaran, M.H., Shin, Y. and Smith, R.J. (2001) 'Bounds testing approaches to the analysis of level relationships', Journal of Applied Econometrics, Vol. 16, pp.289–326.

Çakmak, E. E., & Acar, S. (2022). The nexus between economic growth, renewable energy, and ecological footprint: Empirical evidence from most oil-producing countries. Journal of Cleaner Production, 352, 131548.

Gu, G., Zhu, W., & Wang, C. (2022). Time-varying influence of interest rates on stock returns: evidence from China. Economic Research-Ekonomska Istraživanja, 35(1), 2510-2529.

Khan, M. I., Teng, J. Z., Khan, M. K., Jadoon, A. U., & Khan, M. F. (2021). The impact of oil prices on stock market development in Pakistan: Evidence with a novel dynamic simulated ARDL approach. Resources Policy, 70, 101899.